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# National Priority Chemicals Trends Report (2005-2007)

## Section 4
## Trends Analyses for Specific Priority Chemicals (2005-2007): Hexachloroethane (HCE)

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# Hexachloroethane (HCE)

## Chemical Information

**Alternate Names:** carbon hexachloride, ethane hexachloride, perchloroethane

**General Uses:** HCE is used by the military to make weapons that produce smoke, such as smoke pots and grenades used during training. It is also used to remove air bubbles in melted aluminum. HCE may be present as an ingredient in fungicides, insecticides, lubricants and plastics.

## How Much Hexachloroethane Was Generated?

For 2007, nine facilities reported approximately 5.5 million pounds of hexachloroethane being generated; one facility reported approximately 53 percent of the national total quantity of this PC (please refer to Exhibit 3.4 to see the number of facilities that reported this PC within various quantity ranges). Compared to the total quantities of hexachloroethane reported for 2005 and 2006, the quantity decreased by approximately 609,000 pounds and increased by approximately 1.3 million pounds, respectively (Exhibit 4.30).

**Exhibit 4.30. National Generation of Hexachloroethane (2005–2007)**

| TRI Reporting Year | 2005 | 2006 | 2007 |
|---|---|---|---|
| Total Quantity of HCE (pounds) | 6,095,933 | 4,166,250 | 5,487,132 |
| Number of TRI Facilities Reporting HCE | 9 | 8 | 9 |

## Where Was Hexachloroethane Generated?

Facilities in Louisiana and Texas (both in EPA Region 6) reported approximately 99 percent of the HCE being generated for 2007 (Exhibit 4.31).

Some observations concerning trends for the reported quantity of HCE include:

- Two organic chemical manufacturing facilities (same company) in Harris County, Texas (EPA Region 6) reported large increases for 2006. One of the facilities noted that heavy ends from cracking of ethylene dichloride contain HCE, which was incinerated on site. The quantity of HCE depends on the purity of the feedstock mixture; the increased quantity for 2006 was caused by operational issues. The second facility also attributed the increased quantities in 2006 to operational issues—the facility had to transfer material off site due to a byproduct reactor being down. This material typically would have been recycled and reused in their process.
- An alkalies and chlorine manufacturing facility in Brazoria County, Texas (EPA Region 6) reported a decrease of approximately 1.3 million pounds for 2006.

**Exhibit 4.31. Quantity of Hexachloroethane, for Facilities Reporting 99.3 Percent of Total Quantity, by County (2007)**

| EPA Region | State | County | Quantity (pounds) of HCE | | | Percent of Total Quantity (2007) |
|---|---|---|---|---|---|---|
| | | | 2005 | 2006 | 2007 | |
| 6 | LA | Iberville | 2,682,667 | 2,026,399 | 2,925,491 | 53.3% |
| 6 | LA | Ascension | 1,436,915 | 1,126,704 | 1,325,253 | 24.2% |
| 6 | LA | Calcasieu | 188,874 | 191,720 | 599,960 | 10.9% |
| 6 | TX | Harris | 38,316 | 440,307 | 304,668 | 5.6% |
| 6 | TX | Brazoria | 1,641,075 | 292,794 | 221,830 | 4.0% |
| 6 | TX | San Patricio | 0 | 0 | 72,463 | 1.3% |
| | | **Total** | **5,987,847** | **4,077,924** | **5,449,665** | **99.3%** |

# Which Industries Generated Hexachloroethane?

For 2007, nine facilities in four NAICS codes reported HCE being generated (Exhibit 4.32). Facilities in NAICS code 325199 (All other basic organic chemical manufacturing) accounted for approximately 60 percent of the national total quantity of HCE being generated for 2007, with one of these facilities reporting approximately 53 percent of the national total quantity.

**Exhibit 4.32. Industry Sectors Quantities of Hexachloroethane (2005−2007)**

| Primary NAICS code | NAICS Code Description | Facilities Reporting (2007) | Quantity (pounds) of HCE | | | Percent of Total Quantity (2007) |
|---|---|---|---|---|---|---|
| | | | 2005 | 2006 | 2007 | |
| 325199 | All Other Basic Organic Chemical Manufacturing | 4 | 2,722,594 | 2,467,855 | 3,302,622 | 60.2% |
| 325181 | Alkalies and Chlorine Manufacturing | 3 | 3,266,864 | 1,611,218 | 2,147,043 | 39.1% |
| 325211 | Plastics Material and Resin Manufacturing | 1 | 5,356 | 87,177 | 19,516 | 0.4% |
| 325320 | Pesticide and Other Agricultural Chemical Manufacturing | 1 | 0 | 0 | 17,951 | 0.3% |
| | **Total** | **9** | **5,994,814** | **4,166,250** | **5,487,132** | **100.0%** |

# How Did Facilities Manage Hexachloroethane?

Exhibit 4.33 shows how facilities, by industry, managed HCE in 2007.

**Disposal:** Facilities disposed of only 74 pounds or less than 0.1 percent of the HCE generated.

**Energy Recovery:** Facilities used energy recovery to manage approximately 5 percent of the HCE generated.

**Treatment:** Facilities treated (incinerated), mostly on site, approximately 91 percent of the HCE generated.

In 2007, facilities also recycled approximately 2.6 million pounds of HCE. See Exhibit C.3 in Appendix C for additional information about the recycling of HCE. Facilities also released approximately 6000 pounds of HCE as air emissions and surface water discharges in 2007. See Appendix D for additional information about releases of HCE.

**Exhibit 4.33. Management Methods for Hexachloroethane in Industry Sectors (2007)**

| Primary NAICS Code | NAICS Code Description | Total PC Quantity Reported | Quantity (pounds) of HCE | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Disposal | | Energy Recovery | | Treatment | |
| | | | On-site | Off-site | On-site | Off-site | On-site | Off-site |
| 325199 | All Other Basic Organic Chemical Manufacturing | 3,302,622 | 0 | 0 | 0 | 0 | 3,146,934 | 155,688 |
| 325181 | Alkalies and Chlorine Manufacturing | 2,147,043 | 74 | 0 | 279,739 | 0 | 1,851,587 | 15,644 |
| 325211 | Plastics Material and Resin Manufacturing | 19,516 | 0 | 0 | 0 | 17,055 | 0 | 2,461 |
| 325320 | Pesticide and Other Agricultural Chemical Manufacturing | 17,951 | 0 | 0 | 0 | 131 | 1,145 | 16,675 |
| | **Total** | **5,487,132** | **74** | **0** | **279,739** | **17,186** | **4,999,666** | **190,468** |

# Data Derived From Hazardous Waste Biennial Reports for Hexachloroethane

In this section, we present data about HCE contained in hazardous wastes, derived from information submitted by facilities in Biennial Reports under RCRA. We derived these data by applying a methodology to estimate the quantity of HCE contained in BR waste streams. The estimates of HCE contained in hazardous wastes supplement the data reported to TRI, providing a broader perspective regarding the industries that generate and manage wastes that contain HCE. Based on applying our methodology to the 2007 BR data, we estimate that 36 facilities in 17 NAICS codes reported hazardous wastes containing approximately 1.3 million pounds of HCE. Facilities in two industries: NAICS code 325199 (All Other Basic Organic Chemical Manufacturing) and NAICS code 325181 (Alkalies and Chlorine Manufacturing) accounted for 99.5 percent of the total estimated quantity of HCE in the hazardous waste streams (Exhibit 4.34).

### Exhibit 4.34. Estimated Quantity of Hexachloroethane in Primary Generation Hazardous Waste for Facilities Reporting 99.5 Percent of the Total Priority Chemical Quantity, by NAICS Code (2007)

| Primary NAICS Code | NAICS Code Description | Number of Facilities | Quantity (pounds) of HCE | | | Percent of Total Quantity |
|---|---|---|---|---|---|---|
| | | | Wastewaters | Non-Wastewaters | Total Quantity | |
| 325199 | All Other Basic Organic Chemical Manufacturing | 6 | 0 | 1,117,370 | 1,117,370 | 85.1% |
| 325181 | Alkalies and Chlorine Manufacturing | 6 | <1 | 189,267 | 189,267 | 14.4% |
| | **Total** | **12** | **<1** | **1,306,637** | **1,306,637** | **99.5%** |

In 2007, facilities generated hazardous waste containing HCE in 38 counties within 22 states. Facilities in Louisiana and Texas (EPA Region 6) generated an estimated 97 percent of the HCE contained in hazardous wastes (Exhibit 4.35).

### Exhibit 4.35. States and Counties in Which Facilities Generated 97 Percent of Hexachloroethane Contained in Primary Generation Hazardous Waste (2007)

| EPA Region | State | County | Estimated Quantity of HCE Contained in Hazardous Wastes (pounds) | Percent of Total Quantity of HCE Contained in Hazardous Wastes |
|---|---|---|---|---|
| 6 | TX | Brazoria | 703,266 | 53.5% |
| 6 | LA | Iberville | 305,886 | 23.3% |
| 6 | LA | Ascension | 175,955 | 13.4% |
| 6 | TX | San Patricio | 92,704 | 7.1% |
| | | **Total** | **1,277,812** | **97.3%** |

Exhibit 4.36 shows how facilities reported managing hazardous wastes that contain HCE. For example, facilities incinerated hazardous wastes containing an estimated 537,000 pounds of HCE and recovered hazardous wastes containing approximately 385,000 pounds of HCE. See Appendix E for a full list of the BR management codes and their descriptions.

### Exhibit 4.36. Methods Used to Manage Hazardous Wastes Containing Hexachloroethane (2007)

| Management Method Group | Management Method Code Description | Quantity of HCE Managed (2007) | Percent of Total Estimated Quantity of HCE |
|---|---|---|---|
| Reclamation and Recovery | Other recovery or reclamation for reuse | 385,147 | 29.1% |
| | Energy recovery at this site | 302,049 | 22.8% |
| | Fuel blending prior to energy recovery at another site | 2,122 | 0.2% |
| | Solvents recovery | 3 | <0.1% |
| | **Reclamation and Recovery Total** | **689,322** | **52.0%** |
| Destruction or Treatment Prior to Disposal at Another Site | Incineration | 537,271 | 40.5% |
| | Other treatment | <1 | <0.1% |
| | Chemical oxidation | <1 | <0.1% |
| | Neutralization only | <1 | <0.1% |
| | **Destruction or Treatment Prior to Disposal at Another Site Total** | **537,272** | **40.5%** |
| Disposal | Landfill or surface impoundment that will be closed as landfill | 86,773 | 6.5% |
| | **Disposal Total** | 86,773 | 6.5% |
| Transfer Off Site | Storage, bulking, and/or transfer off site | 12,134 | 0.9% |
| | **Transfer Off Site Total** | 12,134 | 0.9% |
| NA | NA | 18 | <0.1% |
| | **NA Total** | **18** | **<0.1%** |
| | **Grand Total** | **1,325,517** | **100.0%** |